

REMARKS

Claims 1-20 are pending with claims 1-9, 19 and 20 being withdrawn from consideration.

The rejection of Claims 10-18 under 35 U.S.C. § 103(a) over Smith, Sederquist et al and Hudson is traversed.

Claim 10 relates to a shell-and-tube reactor for the continuous preparation of a chemical compound, comprising a shell and at least one noncircular cross-section internal tube located within the shell, **wherein at least one of the internal tubes having the noncircular cross section is at least partly helical in the region in which it is surrounded by the shell.**

Smith discloses a catalytic reactor for the conversion of hydrocarbons employing high space velocities, wherein such a reactor may contain either tubes arranged in parallel with a circular cross-section or a single helically arranged tube, the latter also having circular cross-section. As acknowledged by the Examiner, Smith does not teach reactor tubing having a non-circular cross-section as defined in pending claim 10.

Accordingly, Smith alone does not suggest the subject-matter of pending claim 10.

In addition, Sederquist et al discloses a compact multiple tube steam reformer.

However, Sederquist et al is completely silent as to a particular geometry of the tubes in the actual reformer. The passage of Sederquist et al. referred to by the Examiner in this respect exclusively concerns a separate vaporizer which is located upstream from the reformer (see paragraph [0043] of the description). In particular, said additional vaporizer may be a heat exchange coil which may be a finned tube or a corrugated tube helical coil.

The additional vaporizer is, for example, displayed in Figure 1, wherein it is indicated by reference number 110.

Thus, there is no indication whatsoever in Sederquist et al., which would indicate a particular geometry of a reactor tube to a person skilled in the art.

Furthermore, the terms "*finned*" and "*corrugated*", as employed in Sederquist et al., with respect to the additional vaporizer, do not imply that the cross-section of said tubes would necessarily be non-circular in geometry. Actually, quite the contrary is the case in Sederquist et al., since the vaporizer shown in Figure 1, as indicated by reference number 110, clearly has a circular cross-section.

Accordingly, even when taking into account the teaching of Sederquist et al. with respect to the separate vaporizer, Sederquist et al by no means suggests a non-circular cross-section, but far more indicates a circular cross-section in this respect.

Consequently, on the basis of the foregoing, the subject matter of the pending claims is non-obvious in view of a combination of Smith and Sederquist et al.

The Examiner alleges that Hudson discloses tubes being elliptical in cross-section. In particular, with respect to the specific geometry of said tubes, the Examiner refers to Figures 1 and 2 of said document. In this respect, based on the Figures displayed in Hudson, a non-circular cross-section of these tubes may only be considered with respect to the tubes as such, i.e., with respect to their outer cross-section in which the walls of the tubes are fully taken into account.

Within the meaning of the present application, however, the cross-section of the tubes explicitly refers to the inner cross-section, as may be taken from the 5th full paragraph on page 7 of the description. Thus, referring to said passage, the cross-sectional area as defined in pending claim 10 refers to the free cross-sectional area of a tube or of the shell, wherein the wall thickness of this tube is not taken into account.

With respect to the inner cross-section of the tubes taught in Hudson, however, the aforementioned Figures of said document clearly display a circular geometry. In addition to this, as may be taken from the description of Hudson, on page 2, in lines 13 and 14, a non-circular geometry taught in said document only refers to the external cross-sectional shape of the tubes. On the other hand, with respect to the internal cross-section, Hudson again only explicitly teaches a circular geometry (cf. page 2, lines 20-22, and claim 4). **This is also in perfect agreement with the contents of the Figures.**

Consequently, in view of the foregoing, the subject-matter of pending claim 10 is also not obvious from a combination of Smith and Hudson.

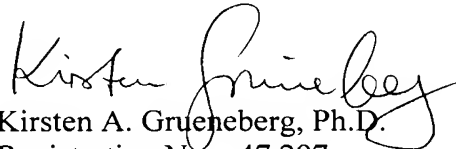
Accordingly, in view of the foregoing, claims 10 to 18 are not obvious in view of the prior art documents cited by the Examiner.

Therefore, the rejection of Claims 10-18 under 35 U.S.C. § 103(a) over Smith, Sederquist et al and Hudson is believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of this rejection is respectfully requested.

This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P.

A handwritten signature in black ink, appearing to read "Kirsten Grueneberg". The signature is fluid and cursive, with the first name "Kirsten" and last name "Grueneberg" clearly distinguishable.

Kirsten A. Grueneberg, Ph.D.
Registration No.: 47,297

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
NFO:KAG:
(OSMMN 08/09)